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(71) Applicant: **Cressi-Sub S.p.A.**
16165 Genova (IT)

(72) Inventor: **Cressi, Leopoldo Antonio**
16167 Genova (IT)

(74) Representative: **Bardini, Marco Luigi et al**
c/o Società Italiana Brevetti S.p.A.
Corso del Tintori, 25
50122 Firenze (IT)

(54) Buoyancy compensator jacket for scuba divers with improved weight pockets

(57) A buoyancy compensator jacket for scuba divers comprises a back portion from two oppcsite sides of which there extend side portions (1) capable of laterally enveloping the diver's trunk and being connected to each other more or less on the diver's chest. On each of said side portions (1) there is provided a main pocket (3) and a weight pocket (6) with a top opening, said weight pocket (6) being arranged externally with respect to the main pocket (3) and is capable of accommodating a bag (16) containing weight elements. Means (12) for closing the top opening of the weight pocket (6) are also provided. The main pocket (3) forms a compartment (9) for concealing the closure means (12) of the top opening. On the outside of the weight pocket (6) there are arranged engagement means (13, 15b) for engaging alternatively, either with complementary engagement means (15a) arranged on the closure means (12), or with complementary engagement means (20, 22) associated with the weight bag (16) to keep it in position within the weight pocket (6).

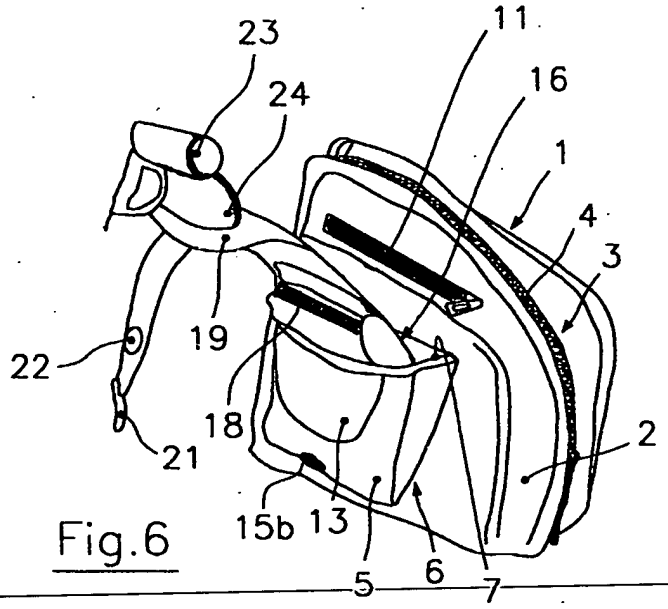

Fig.6

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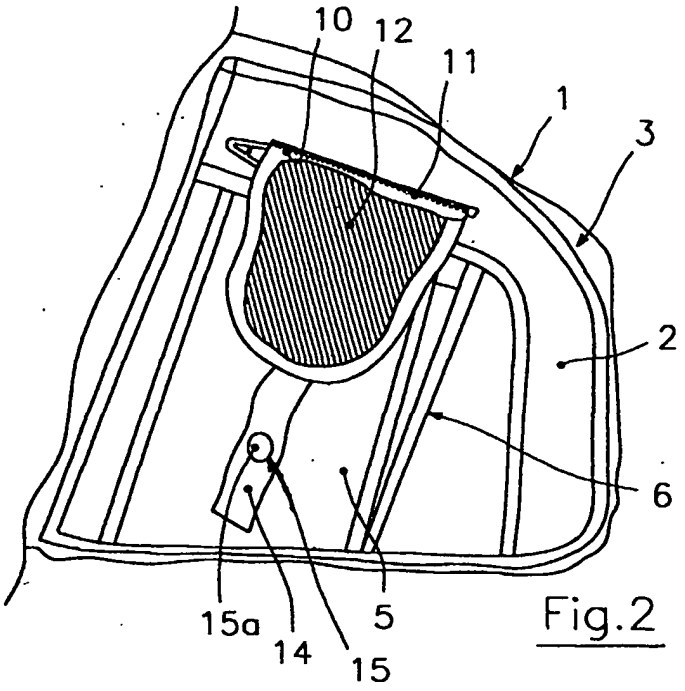

Fig.2

Description

[0001] The present invention concerns the field of equipment for scuba divers and, more particularly, a new type of buoyancy compensator jacket.

[0002] It is known that scuba divers and, more generally, all those who engage in underwater swimming, hereinafter simply referred to as divers, make use of buoyancy compensator jackets with one or more air chambers. These can be inflated, by mouth or thanks to compressed gas inflation means, and deflated to provide for buoyancy trim or compensation to the diver.

[0003] In greater detail, the aim of these jackets is that of maintaining the buoyancy of the diver to a substantially neutral state as his depth varies, thereby assuring that he will always be able to move with the utmost ease in all directions. In fact, it has to be considered that as the diver dives deeper the increase of water pressure tends to compress not only some of the body cavities, but also the wet suit and the diving equipment associated therewith, so that the inherent lifting characteristics will decrease, making the ascension movements harder. Such decrease will therefore be compensated by means of a progressive inflation of the jacket. Conversely, as the diver ascends to the surface, his inherent buoyancy will increase and the jacket must therefore be gradually deflated in order to maintain the overall buoyancy at a substantially neutral level.

[0004] Weight belts are traditionally used in order to assist in neutralizing the buoyancy. They are provided with quick-release buckles that enable the diver, in case of an emergency, to readily free himself of the additional weight, thus assisting his return to the surface. Recently, moreover, there has become more and more frequent the incorporation of at least a part of the weight means in the buoyancy compensator jacket, because the belt is not comfortable to wear and constitutes an obstacle to the diver's movements. For the purposes of the aforementioned safety requirements, however, the possibility of freeing oneself of the weight quickly and easily must be assured.

[0005] A buoyancy compensator jacket suitable for incorporating weight means is described in Italian Utility Model No. 244660 in the name of the present applicants. The weight elements are placed in pockets formed in the side portions of the jacket. Each pocket is arranged in proximity of the back portion of the jacket and has a substantially tubular shape, with a top opening for introducing the weight elements and a bottom opening for allowing them to drop out. Respective closure means are associated with these openings. The closure means of the bottom openings make use of quick-release buckles.

[0006] This solution is very effective. Nevertheless, it has not brought to an end the search for alternative solutions capable of combining a functional result of comparable efficacy with improvements in aesthetic appearance supplementary useful features, taking also into account the production costs. The applicants have now conceived a new type of jacket that, thanks to weight pockets having an original configuration, crowns this search with a particularly favorable result.

[0007] The buoyancy compensator jacket in accordance with the present invention comprises a back portion and two side portions extending form respective opposite sides of the back portion, said side portions being suitable for wrapping the diver's trunk and connecting to each other on his chest. A main pocket and a weight pocket with a top opening are formed in each of said side portions. The weight pocket is arranged on the outside of the main pocket and is fit for housing a weight-containing bag, closure means for said top opening of the weight pocket being also provided. The jacket is characterized in that a compartment is formed in the main pocket for concealing the closure means of said top opening, and by the fact that engagement means are placed on the outside of the weight pocket, complementary engagement means being provided on the closure means and on the weight bag, whereby the engagement means of the weight pocket are engageable either with complementary engagement means of the closure means, or with complementary engagement means associated with the weight bag in order to keep the latter in position within the weight pocket.

[0008] Other features and advantages of the buoyancy compensator jacket in accordance with the present invention will be brought out more clearly by the description about to be given of a particular embodiment thereof, which is given by way of example and is not to be considered limitative in any way, the description making reference to the attached drawings, in which:

- figure 1 shows a schematic view of a side portion of the jacket in accordance with the invention, with the weight pocket in the open configuration;
- figure 2 shows a view similar to the one of figure 1, but with the pocket in the closed configuration;
- figure 3 shows a schematic section takes along lines III-III of figure 1;
- figure 4 shows a perspective view of a weight bag to be arranged in one of the pockets of the jacket in accordance with the previous figures;
- figure 5 shows a perspective view of the side portion of the jacket of the previous figures, with the weight bag inserted in its pocket; and
- figure 6 shows a perspective view similar to the one of figure 5, but with the weight bag in the phase of being extracted from its pocket.

[0009] Referring to the aforesaid figures, the buoyancy compensator jacket in accordance with the present invention, which is neither illustrated not described in its entirety inasmuch as its structure and functionality are of a type well known to a person skilled in the art, is provided with two side portions 1 - only one of which is shown in the figures - that extend from opposite sides

of a back portion - likewise not shown - of the jacket. The side portions 1, of a conventional four-sided overall shape, are suitable for wrapping laterally round the diver's trunk and to be connected to each other in a known manner substantially on his chest by means of a belt not shown in the figures.

[0010] On the outer surface of each side portion 1, a patch 2 attached in gusset-fashion defines a main pocket 3, the inside of which is accessible from the top side through an opening closed by a zip fastener 4 that can be seen in figures 5 and 6 and, in section, also in figure 3. A further patch 5 is attached in gusset-fashion on the outside of patch 2, generating a weight pocket 6 that, when seen from in front as in figures 1 and 2, is of smaller width and height than the main pocket 3, and extends in a slightly oblique direction. As shown in the section view of figure 3, the weight pocket 6 delimits a housing 7 of composite shape, with an outer portion 7a that extends outside patch 2 of main pocket 3 and an inner portion 7b that, through an opening formed in patch 2, projects into the interior of main pocket 3, though being physically separated therefrom by a partition 8 that extends between patch 2 and side portion 1.

[0011] As can again be seen particularly well in figure 3, gusset-shaped patch 2 of main pocket 3 has a twin layer structure that defines a compartment 9 accessible from the outside through a slit 10 running above the upper edge of weight pocket 6. Slit 10 is closed by a zip fastener 11. Compartment 9 accommodates a tongue of fabric, joined to the interior of patch 2 contiguously to slit 10 and extractable from the compartment through the same slit, so as to be able to act, as can be seen in figure 2, as a cover flap 12 for closing weight pocket 6. To this end, cover flap 12 is provided on its inside face (reference is made to the extracted configuration of figure 2) with a Velcro® closure element - not shown in the figure - that engages with a complementary element 13 that can be seen in figures 1 and 6 and is sewn to the outside of patch 5 of weight pocket 6.

[0012] Furthermore, from cover flap 12 there extends in a longitudinal direction a strip 14 having the function of making it easier for the diver to get hold of the flap. A first element 15a of a snap fastener 15 is fixed to strip 14. The complementary element 15b of the same fastener 15 is attached to patch 5 of weight pocket 6 below Velcro ® element 13. The closure of weight pocket 6 by cover flap 12 is thus rendered more secure by snap fastener 15.

[0013] Referring now in particular to figure 4, a weight bag 16 for insertion into weight pocket 6 is preferably made of a semi-rigid material and has the overall shape of a parallelepiped with an opening 17 on one of its faces. Opening 17 has a zip fastener for closure and permits one or more weight elements to be inserted. In this way it is possible to obtain the desired overall weighting, the determination of which requires due account to be taken of the body weight of the diver who will wear the jacket.

[0014] Weight bag 16 is also provided with a closure flap 19 that projects from a face that comes to be situated along the edge of weight pocket 6 when the bag is inserted. Cover flap 19 has a configuration wholly similar to the configuration of cover flap 12 of the weight pocket and on its inside face is provided with a Velcro® element for engagement with element 13 on patch 5, and also has a strip 21 with an element of a snap fastener 22 for engagement with element 15b.

[0015] Furthermore, as can be seen from figures 5 and 6, from the outer face of cover flap 19 there projects a small gripping knob 23. More precisely, knob 23 is connected to a tongue 24 sewn to cover flap 19 along its edge. Tongue 24 therefore points with its free end, to which knob 23 is attached, towards the base of cover flap 19. This free end is releasably attached to cover flap 19 by means of a further Velcro® connection of which an element 25 is attached to flap 19 and can be seen in figure 5.

[0016] Thanks to cover flap 19, when weight bag 16 is inserted in housing 7 of pocket 6, it can be locked firmly in position - as can be seen in figure 5 - due to the effect of the simultaneous action of Velcro® elements 20, 13 and the snap fastener elements 22, 15b. A supplementary Velcro® connection between the rear of weight bag 16 and patch 2 can contribute to further enhancing the firmness of the positioning of the bag. The element of this connection attached to patch 2 can be seen in the section of figure 3, where it is indicated at the reference number 26.

[0017] In the configuration that has just been described, cover flap 12 associated with patch 2 of main pocket 3 is concealed into compartment 9, which is closed by zip fastener 11. Thanks to the shape of housing 7 and, more particularly, its inner portion 7b which deprives main pocket 3 of useful space, but also thanks to the deformability of this pocket, bag 16 will not protrude excessively from the front of side portion 1, thus reducing to a minimum the discomfort that it could cause for the diver's movements. Moreover, the small gripping knob 23 will remain in contact with cover flap 19 of the weight bag 16 thanks to the Velcro connection acting on tongue 24.

[0018] In case of emergency, the diver can get rid of bag 16 - and therefore also of the weight it contains - with the greatest of ease. To this end, all he has to do is to apply a firm upward and outward pull to flap 19 by means of gripping knob 23. In fact, as can be deduced from figure 6, this action will cause tongue 24 to become detached from flap 19 and be raised towards the outside. Apart from making it easier for the diver to get a comfortable grip on knob 23, this will bring the point of exertion of the force into a favorable position for causing the disengagement of snap fastener element 22 of strip 21. Continuing the pull, weight bag 16 will therefore be quickly extracted from housing 7 of pocket 6.

[0019] Obviously, when housing 7 of weight pocket 6 is not used for accommodating a weight bag 16, it can

be made available as an object-holder. When cover flap 12 is extracted and placed on the outside of patch 5 of pocket 6, with which it becomes engaged by means of the Velcro® elements and the snap fastener 15, housing 7 will become closed in an absolutely secure manner.

[0020] The above makes it clear that the weight pocket in accordance with the present invention offers an extremely satisfactory result as regards the stability with which the jacket carries the weight, and the possibility the diver has of getting rid of the weight quickly and safely in the agitation caused by an emergency. Both these functions are performed by flap 19 of weight bag 16, which acts both as a fixing means and as a pull-out strap.

[0021] On the other hand, use of weight pocket 6 as an object-holder is encouraged thanks to the safety and the pleasant aesthetic appearance assured by cover flap 12, which avails itself of the elements (Velcro® and snap fastener) already provided for the connection with weight bag 16. As far as this latter point is concerned, it should also be noted that the configuration of the weight pocket in accordance with the invention is very simple, so that the pocket can be produced at an extremely limited cost. Lastly, it should be underscored that, as already mentioned, thanks to the composite form of housing 7 of weight pocket 6, incorporation of the weights in the buoyancy compensator jacket does not involve an excessive bulge on the outside of the jacket.

[0022] Variations and/or modifications may be brought to the buoyancy compensator jacket for scuba divers with improved weight pockets in accordance with the invention without departing from the scope of the invention itself.

Claims

1. A buoyancy compensator jacket comprising a back portion and two side portions (1) extending form respective opposite sides of said back portion, said side portions (1) being suitable for wrapping the diver's trunk and connecting to each other on his chest, each of said side portions (1) further comprising a main pocket (3), a weight pocket (6) arranged on the outside of said main pocket (3) and defining a top opening for housing a weight-containing bag (16), and closure means (12) for said top opening of said weight pocket (6), said jacket being **characterized in that** a compartment (9) is formed in said main pocket (3) for concealing said closure means (12) of said top opening, and by the fact that engagement means (13, 15b) are placed on the outside of said weight pocket (6), complementary engagement means (15a, 20, 22) being provided on said closure means (12) and on said weight bag (16), whereby said engagement means (13, 15b) of said weight pocket (6) are engageable either with complementary engagement means (15a) of said closure means (12), or with complementary engagement means (20, 22) associated with said weight bag (16) in order to keep the latter in position within said weight pocket (6).

2. The jacket according to claim 1, wherein said main pocket (3) is defined between said side portion (1) and a twin-layer patch (2) that forms said compartment (9), the latter being accessible from the outside by means of a slit (10) running above said top opening of the weight pocket (6), said closure means (12) consisting of a cover flap (12) connected to the interior of said compartment (9) in proximity of said slit (10), said weight bag (16) being provided with an equally shaped cover flap (19) capable of being arranged outside said weight pocket (6) when said bag (16) is inserted in it.

3. The jacket according to claim 2, wherein said slit (10) of said compartment (9) is closed by a zip fastener (11).

4. The jacket according to claim 2 or claim 3, wherein said engagement means (13, 15b) on the outside of said weight pocket (6) comprise a Velcro® element (13), complementary Velcro elements being arranged, respectively, on an internal face of said cover flap (12) for closing the weight pocket (6) and on an internal face of said cover flap (19) of said weight bag (16).

5. The jacket according to claim 4, wherein both said cover flap (12) for closing said weight pocket (6) and said cover flap (19) of said weight bag (16) comprise respective strips (14, 21) projecting from the free edge, in order to make it easier for the diver to grip the cover flaps (12, 19), said engagement means (13, 15b) on the outside of said weight pocket (6) comprising also a snap fastener element (15b) arranged below said Velcro® element (13), complementary snap fastener elements (15a, 22) being provided, respectively, on said strip (14) of said cover flap (12) for closing said weight pocket (6) and on said strip (21) of said cover flap (19) of said weight bag (16).

6. The jacket according to any of claims 2 to 5, comprising a supplementary Velcro® connection (26) within said weight pocket (6), acting between said weight bag (16) and said patch (2).

7. The jacket according to any of claims 2 to 6, wherein grip means (23, 24) project from an outside face of said cover flap (19) of said weight bag (16).

8. The jacket according to claim 7, wherein said grip means (23, 24) comprise a tongue (24) connected

to the edge of said cover flap (19) of said weight bag (16) and pointing with its free end, to which a small gripping knob (23) is fixed, towards the base of said cover flap (19), said free end of said tongue (14) being reversibly connected to said cover flap (19) of said bag weight (16) by means of a further Velcro® connection (25).

9. The jacket according to any of claims 2 to 8, wherein said weight pocket (6) defines a housing (7) comprising an outer portion (7a) that extends on the outside of said patch (2) of said main pocket (3), and an inner portion (7b) that, through an opening provided on said patch (2), projects into the interior of said main pocket (3), though being physically separated therefrom it by means of a partition (8) that extends between said patch (2) and said side portion (1).

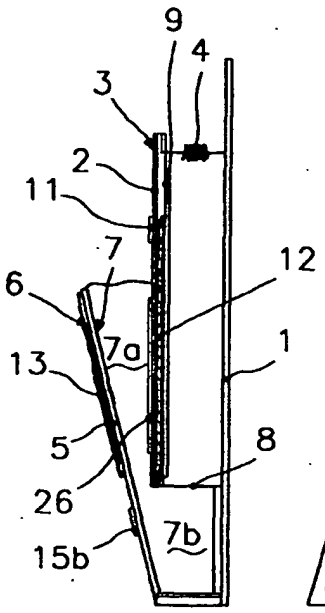

Fig.3

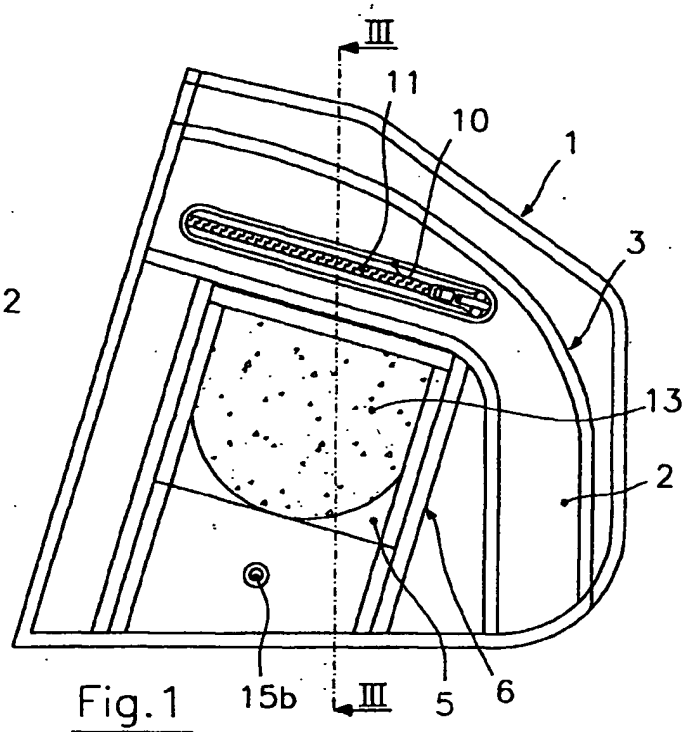

Fig.1

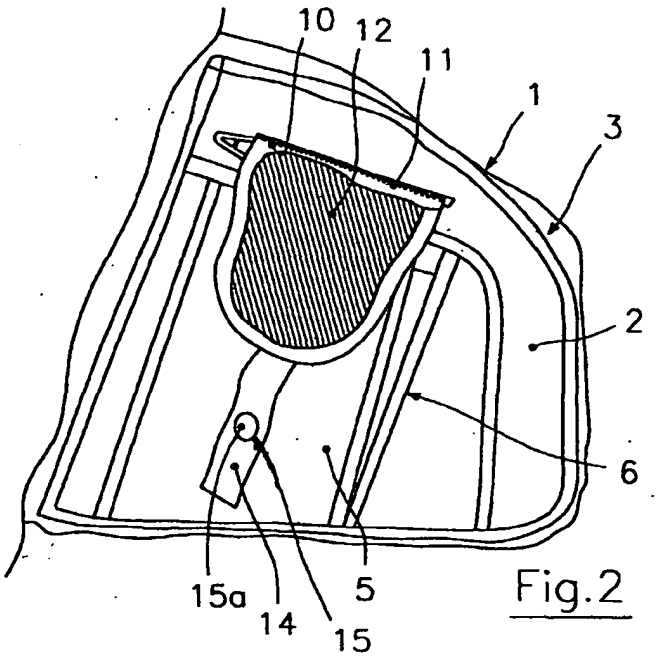

Fig.2

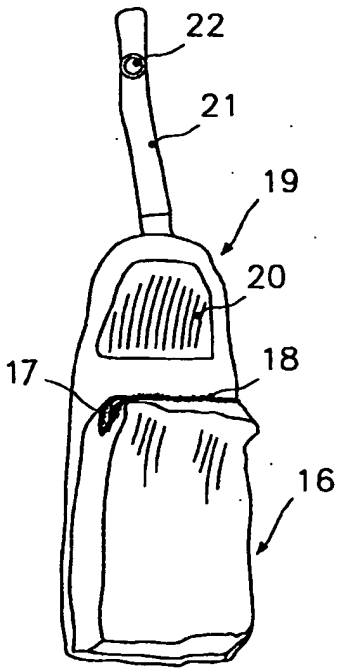

Fig.4

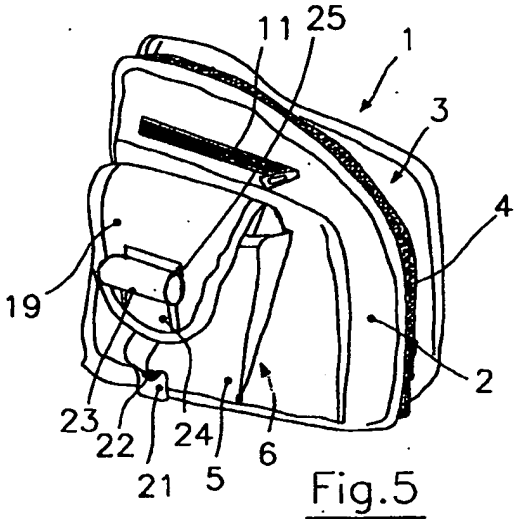

Fig.5

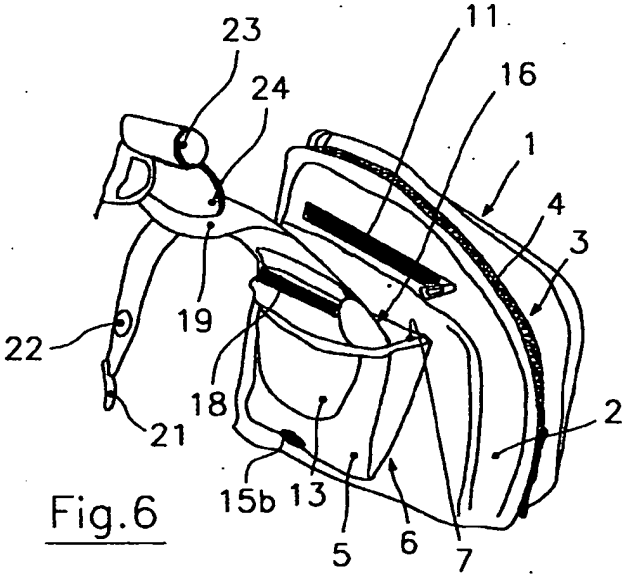

Fig.6

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EUROPEAN SEARCH REPORT

Application Number
EP 03 42 5283

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 August 2003	van Rooij, M

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